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# Student perception of the Agricultural Sciences and Humanities undergraduate courses at São Paulo State University (UNESP), Brazil*[1]

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## Abstract

In the scenario of Brazilian Higher Education Institutions, the justifications for dropout or permanence of students vary according to the school and its courses, given their peculiarities, as well as those of their students. However, studies and governmental actions on school dropout are still scarce, which shows the lack of innovation on this topic. Thus, the general objective of the present work is to evaluate the perception of graduates and student dropouts in relation to their undergraduate courses in the areas of Agricultural Sciences and Humanities, from the Experimental Campi of the São Paulo State University (UNESP), Brazil. Specifically, it is intended to show a methodological procedure that can identify which specific elements have influenced the students' decision to evade or to stay in the referred courses. Thus, a survey was carried out through a structured questionnaire with 40 multiple choice sentences, which was applied by email and through social networks to a probabilistic sample of 243 respondents. Finally, the multivariate clustering analysis associated with testing nonparametric hypotheses was used to verify the existence of a difference between the perceptions of graduates and dropouts that indicated influence on their decision. The results showed that, in general, graduates and dropouts have positive perceptions regarding the chosen course, as well as with respect to the general infrastructure conditions of the campi. For two courses, one

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in each area, significant differences were observed between the perceptions of graduates and dropouts, with mainly intrinsic characteristics related to students and their well-being, such as identification with the course; motivation and persistence to achieve the objectives; personal and / or family health and stability; and socio-academic integration with other students were those that directly or indirectly interfered in decision-making.

## Keywords

School dropout – Student residence – Higher education – Brazilian universities.

## Introduction

In the scenario of Brazilian Higher Education Institutions (HEI), the justifications for dropout or permanence, pointed out in several studies, vary according to the school and the courses surveyed, given their peculiarities, as well as those of their students (SILVA, 2013).

Although it is a decision of the student whether or not to drop out of a course, it is understood that the way the HEI is structured to offer undergraduate courses and the conditions provided for the maintenance of the student can be critical in this decision. There is also a response from the job market regarding the acceptance of graduates, which can also influence the student's choice to remain in the course in which they entered. Thus, it is clear that the student's decision is permeated by factors from different contexts.

An assessment of student dropout should be based on studies that provide knowledge and information on the subject, in order to contribute to the development of strategies for its control. However, government studies and actions on school dropout are still scarce, which shows the lack of innovation on this topic.

Thus, the general objective of this work is to evaluate the perception of graduates and dropouts in relation to courses in the areas of Agricultural Sciences and Humanities, from the Experimental campi of the São Paulo State University (UNESP), Brazil. Specifically, it is intended to highlight a methodological procedure that can identify which specific elements have influenced the decision making of students to evade or to stay in the referred courses, in order to subsidize management bodies to the application of public policies to combat evasion in the university.

UNESP is one of three public universities maintained by the Government of the State of São Paulo, together with the University of São Paulo (USP) and the State University of Campinas (UNICAMP). Founded in 1976, UNESP stands out in teaching, research, and service extension of the community. It currently has 24 units, 22 in the interior, one in the capital and one on the coast of São Paulo, which jointly offer 183 different undergraduate courses in 60 higher education careers (MASSINI-CAGLIARI *et al.*, 2018).

Seven of these units, located in cities in the countryside of São Paulo State (cities of Dracena, Itapeva, Ourinhos, Registro, Rosana, Sorocaba and Tupã), began their academic activities with eight new courses in the second half of 2003, through an Expansion Plan at UNESP, and they were entitled Experimental Campi (EC).

UNESP's EC are going through a consolidation process, aiming to become proper university units, that is, with the same academic and administrative structure as the others. In 2015, three EC became university units, from Dracena, Sorocaba and Tupã, now titled, respectively, Faculty of Agricultural and Technological Sciences (FCAT), Institute of Science and Technology (ICT), and School of Sciences and Engineering (FCE).

In this process, maturity and quality of teaching are requirements to be achieved, and student evasion must be constantly evaluated and resolved, based on the identification, measurement and understanding of its causes.

## Bibliographic review

### Student dropout in higher education

According to Silva Filho *et al.* (2007), student dropout is one of the problems that most afflict HEIs, and the search for its causes is the subject of several national and international studies, as it implies the result of educational systems. If evasion in the private sphere decreases the income of the HEI, in the public sphere, it is seen as a loss of the public good. But, in both cases, student evasion creates idleness for professors, employees, equipment and physical space, that is, academic, social, and economic waste.

Tinto (1975) proposes a theoretical model called Theory of Student Integration (TSI) to analyze student permanence or dropout in higher education. Subsequently, Tinto (1993) points out four factors that may influence the student's decision to evade or remain in higher education: attributes prior to their admission to the HEI; relationship between the objectives and commitments of the students and the institution; formal and informal relationships established in the academic and social environment; and academic and social integration provided by the previous factors.

Since then, some studies have dealt with the causes of student dropout in higher education considering institutions and / or courses, without evaluating the type of influence on the student's personal decision to drop out (MAINARDES *et al.*, 2010; DIOGO *et al.*, 2016). Other studies assess the profile of dropouts by relating them to the reasons stated by them for dropping out of courses (BARDAGI; HUTZ, 2009; POLYDORO *et al.*, 2005). Some authors argue that the adoption of strategies to reduce student dropout should be directly related to the adoption of retention policies (SILVA, 2013; TAMIN, 2013; TONTINI; WALTER, 2014).

In this sense, it is important to consider comparatively the view of students who drop out and those who decide to stay at the university and finish the course (graduate), since particular characteristics can be distinguished, as well as the conditions offered

by HEIs to meet the needs of the students and guarantee their permanence. In addition, the evaluation of the course by students who have graduated is fundamental, as they experience the reality of the job market and can point out what contributes positively or negatively to their professional life and career (NERES, 2015). Almeida (2018) also reinforces that research with graduates is essential for the planning, definition, and feedback of an institution's educational policies.

Cunha and Carrilho (2005) bring to the discussion a psychosocial perspective for dropout, which they consider linked to the difficulty of adaptation and academic performance, that can be affected by the experiences of the student during the year of entry into higher education. Teixeira and Castro (2015) include the stakeholders[3] of the HEIs in this debate. The stakeholders are composed of several actors ranging from the students themselves and candidates for admission, their family members, teachers, the media, fostering institutions, the surrounding society, and the community job market.

Baggi and Lopes (2011) also point out the lack of financial resources as one of the main factors for student dropout in higher education. However, they emphasize that dropout cannot be analyzed without considering a broader historical context, as they consider that the reality experienced at previous levels of education reflects in the form of dropping out of a higher education course. In addition to previous deficient school education, Santos (2014) also highlights that the lack of motivation to remain studying, the difficulty of organizing the time available for studies and / or reconciling study and work are among the main reasons that lead to student dropout.

In a complementary way, Silva (2013) points out that the main reasons for evasion in Brazilian HEIs pointed out in different studies are: lack of career perspective; low level of commitment to the course, participation in academic activities and school performance; lack of family support; and precarious installations of the HEIs.

With regard to actions to combat school dropout, Baggi and Lopes (2011) affirm that there must be monitoring and implementation of public educational policies in relation to equal opportunities for access to education. Besides, the institutional evaluation, as it occurs within the HEI, with the academic community, in the teaching work, in the management of institutions and in the curriculum definition, is an important means of correcting goals and objectives, promoting new institutional methods that guarantee the permanence of the student.

Furtado and Alves (2012) consider that the activities of professional guidance and creation of events for students, to rescue those with disabilities in the formation of high school, are possible instruments to be implemented by universities in combating student dropout. In this sense, Bardagi and Hutz (2009) report that involvement in curricular and / or extracurricular activities has a positive impact on commitment and

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**3-** Stakeholders are the people who are directly or indirectly linked to an organization and have interference with it.

satisfaction with the course, promoting integration with the university environment and reducing dropout.

There are also student assistance policies, which aim to direct resources and mechanisms that enable students to remain in their courses, so that they can complete them satisfactorily. These policies must be focused on issues of an economic nature (financial aid) and of a pedagogical and psychological nature, contributing to the reduction of the effects of social inequalities and discouraging student evasion (IMPERATORI, 2017).

An example of a student permanence policy is the National Student Assistance Plan (*Plano Nacional de Assistência Estudantil*, PNAES), which was created in 2007 with the aim of assisting low-income students enrolled in on-campus undergraduate courses at federal HEI. The actions of the Plan involve transport assistance, student housing, food, digital inclusion, pedagogical support, health care, among others.

Other examples are the Higher Education Financing Fund (*Fundo de Financiamento do Ensino Superior*, FIES) and the University for All Program (*Programa Universidade para Todos*, PROUNI), created in 1999 and 2004, respectively. The first fund finances undergraduate courses in private HEIs for students who are unable to afford the cost of tuition for their courses. The second program provides partial and full scholarships for undergraduate courses in, also private, HEIs. The selection of scholarship students uses the National High School Exam (ENEM) score as a basis.

Finally, one can highlight the programs to support student permanence at USP, UNESP and UNICAMP, in the state of São Paulo, Brazil, which grant aid and develop support actions for students in situations of socioeconomic vulnerability, seeking to improve the condition of university life, and provide opportunities for these students to stay and graduate.

## Methodology

The present work is a descriptive research, in terms of objectives, with a quantitative approach. The unit of analysis are graduates and dropouts from undergraduate courses in the fields of Agricultural Sciences (Zootechnics of FCAT / Dracena and Agricultural Engineering of CE / Registro) and Humanities (Geography of CE / Ourinhos, Tourism of CE / Rosana and Management of FCE / Tupã) from the São Paulo State University (UNESP), enrolled in the academic periods from 2003 to 2013.

Although they became university units in 2015, the campi de Dracena and Tupã are treated here as Experimental Campi, since this work is based on data referring to students enrolled in these courses in academic years prior to 2015. The concept of evasion established by the Special Commission for Studies on Evasion in Brazilian Public Universities is also considered. That means, the concept of evasion is "the student's definitive departure from their original course, without completing it" (ANDIFES/ABRUEM/SESu/MEC, 1997, p. 15).

To achieve the proposed objectives, the survey method was applied to obtain information from the students, through a probabilistic sampling survey, and a questionnaire[4] structured with multiple choice questions, applied by email and social media[5] to graduates and dropouts in order to assess their perceptions of the undergraduate course they dropped out of or completed[6]. The questionnaire consisted of 40 variables (sentences or assertions). Of these, 34 were extracted from the literature, summarized, and validated by Tontini and Walter (2014). Another six were proposed in this study. Each variable is associated with a specific dimension of propensity to drop out or stay in the course and corresponds to an agreement scale of the 5-Point Likert Scale. Each respondent pointed out a level of agreement for each of the sentences, indicating one of the possible points on the scale, which ranges from one (strongly disagree) to five (strongly agree). The proposed scale with 40 sentences ($V_1$ to V40) was validated by five specialists in the field of Higher Education Management and adjusted to the research objectives, as shown in Chart 1.

Considering the procedure for estimating the population proportion for the infinite population (MARTINS, 2005), since the total number of graduates and dropouts from each course in the analyzed period is not available, the sample size was assessed by calculating the estimate error or margin of error ($d$), given by:

$$(1) \quad d=z\sqrt{(pq/n)}$$

where $z = 1.96$ (abscissa of the standard normal distribution assuming a 95% confidence level) and $n$ is the sample size achieved.

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[4] A questionnaire is a data collection instrument composed of a series of questions or ordered variables, applied without the presence of the researcher.

[5] In order to increase the sample size, it was also decided to carry out the research through social networks, since many emails and telephones included in the Graduation System (Sisgrad) or informed by the students to the UNESP Entrance Exam Foundation (VUNESP) were no longer active.

[6] In compliance with the ethical procedures established for scientific research with UNESP students, the 'Term of Commitment for the Use of Institutional Data' was signed with the Office of the Dean of Undergraduate Affairs of the institution. In this term, the researchers guarantee the anonymity / confidentiality of the research subjects (students), as well as the dissemination of the results only in academic and / or scientific circles, in line with Proc. 471389 / 2014-5 of CNPq 22/2014.

**Chart 1 -** Variables of the study

| Code Variable | Variables (Sentences) |
|---|---|
| Y | Student condition (graduate or dropout) |
| $V_1$ | The course is of good quality. |
| $V_2$ | The curriculum of the course is organized. |
| $V_3$ | The curriculum of the course is up to date. |
| $V_4$ | It is possible to relate theory to practice. |
| $V_5$ | The evaluation system is adequate. |
| $V_6$ | I can apply what I learnt to the job market. |
| $V_7$ | Course Professors are efficient in transmitting knowledge. |
| $V_8$ | The course met my academic needs. |
| $V_9$ | The course coordination met my academic needs. |
| $V_{10}$ | The institution met my academic needs. |
| $V_{11}$ | Course Professors met my academic needs. |
| $V_{12}$ | The leisure area and / or food court (or equivalent) met my needs. |
| $V_{13}$ | Social, cultural and / or sporting events are of good quality. |
| $V_{14}$ | Academic, scientific events, seminars, lectures, etc. are of good quality. |
| $V_{15}$ | Teaching laboratories have adequate structure and materials. |
| $V_{16}$ | The library has an adequate structure and collection. |
| $V_{17}$ | The classrooms are in good condition. |
| $V_{18}$ | The general infrastructure of the campus is in good condition. |
| $V_{19}$ | The bathrooms are clean and in good condition. |
| $V_{20}$ | The equipment in the classroom is of quality and has adequate conditions of use. |
| $V_{21}$ | The course provided me with knowledge. |
| $V_{22}$ | The course contributed to my personal development. |
| $V_{23}$ | I got good grades. |
| $V_{24}$ | I had the need to reinforce classes. |
| $V_{25}$ | The course provides good professional opportunities. |
| $V_{26}$ | The course provides a good professional conception. |
| $V_{27}$ | I had a good socio-academic integration with the other students in class. |
| $V_{28}$ | I participated in extracurricular activities (Extension Projects, Monitoring, etc.). |
| $V_{29}$ | I had identified myself with the chosen course. |
| $V_{30}$ | The course was important for my professional qualification. |
| $V_{31}$ | I was committed to the course. |
| $V_{32}$ | I had enough time available for the studies. |
| $V_{33}$ | I had enough time available to attend classes. |
| $V_{34}$ | My family / personal income was sufficient for my stay in the course. |
| $V_{35}$ | I had good housing and transportation conditions. |
| $V_{36}$ | I needed a scholarship to stay on the course. |
| $V_{37}$ | I had personal and family stability during the course. |
| $V_{38}$ | I was healthy during the course. |
| $V_{39}$ | I was motivated to achieve my goals. |
| $V_{40}$ | I was persistent in achieving my goals. |

Source: Elaborated by the authors.

Data collection was carried out between the months of May and October 2018. Thus, the sample size achieved (according to the survey replies during the referred period) was: 243 students, more specifically, 77 in the field of Agricultural Sciences, and 166 in Humanities, according to the distribution described in Table 2.

Table 1 also shows the estimate errors (*d*) for variable Y (student condition) obtained from the acquired samples, which are lower than the value of 15% accepted by Neres (2015), being slightly above the value of 11% accepted by Almeida (2018), with the exception of the Management course. Thus, it was admitted that the samples in this work are representative of the populations under study, since the respective estimation errors cannot be considered high.

**Table 1 -** Sample survey by course

|  | Agricultural Engineering | Zootechnics | Geography | Tourism | Management |
|---|---|---|---|---|---|
| Graduate (*p*) | 80% | 84% | 79% | 73% | 81% |
| Dropout (*q*) | 20% | 16% | 21% | 27% | 19% |
| Sample size | 45 | 32 | 48 | 48 | 70 |
| Estimate error (*d*) | 11.7% | 12.7% | 11.5% | 12.5% | 9.2% |

Source: Research data, 2008.

The collected data were analyzed descriptively, through tables and descriptive measures, using the multivariate clustering analysis in order to identify clusters of variables that influenced the student's decision to evade or stay in the chosen course.

According to Hair Jr. *et al.* (2009), the analysis of clusters is used in order to aggregate elements based on similar characteristics, resulting in high homogeneity within and between clusters. In this work, for the formation of clusters, the agglomerative hierarchical procedure was used.

One of the most used methods in the analysis of clusters is Ward's method, which is based on the construction of a matrix of similarities or differences in order to reduce the square of the Euclidean distance to the averages of the conglomerates. It is also based on the representation of this process by means of a dendrogram or graph in the form of a tree. This dendrogram shows, in the direction of the horizontal line, the distance that each cluster was formed and, in the direction of the vertical line, how far each object is in relation to the other (HAIR JR. *et al.*, 2009).

Finally, to confirm the results obtained in the multivariate analysis, the sentences or variables of each cluster formed were summarized by means of regression lines, each representing a set of grouped sentences in relation to a course. Thus, to identify whether, in general, there is a significant difference between the perception of graduates and dropouts

from a given course for each set of sentences or cluster formed, the Mann-Whitney non-parametric test was used, since the condition of normality of the coefficients that make up each of these lines is not satisfied. Then, under the null hypothesis (Ho) of equality between means, that is, there is no significant difference in the perception of the course, if value $p$ is less than or equal to α, Ho is rejected.

All analyzes were performed using the software SPSS® version 22, and a significance level α of 5% was considered for the performed hypothesis tests.

## Results

### Field of Agricultural Sciences, Courses: Agricultural Engineering (EC of Registro/SP) and Zootechnics (EC of Dracena/SP)

In Table 2, the lowest percentages obtained in the survey (below 50%) were highlighted, indicating that less than half of the graduates and dropouts from the agricultural sciences under study showed agreement (partial or full) with the respective sentence.

According to Table 2, it is observed, for both courses, that the majority of those surveyed (between 63% and 97%) partially or fully agree that the course was of good quality; that the curriculum matrix was organized and up to date, that the evaluation system was adequate, that it was possible to relate theory to practice, and that professors were efficient in transmitting knowledge.

With regard to academic needs, more than 77% of the students of the Agricultural Engineering course evaluated that their needs were attended. However, for the students of the Zootechnics course, only a little more than half (between 51% and 70%) considers that the course, the institution, the coordination, and the professors met their needs.

Regarding the commitment to the course and the availability of time for studies and to attend classes, the vast majority of students in both courses (between 71% and 98%) consider that they were dedicated. In this sense, both students of Agricultural Engineering and Zootechnics agree that they obtained good grades and that they did not need to reinforce classes.

**Table 2 -** Agreement (partial or full) of graduates and dropouts for each sentence: courses in the area of Agricultural Sciences

| Variable | Agricultural Engineering | Zootechnics | Variable | Agricultural Engineering | Zootechnics |
|---|---|---|---|---|---|
| $V_1$ | 97.1% | 96.9% | $V_{21}$ | 97.1% | 100 % |
| $V_2$ | 89.6% | 96.9% | $V_{22}$ | 95.7% | 73.8% |
| $V_3$ | 79.3% | 79.1% | $V_{23}$ | 92.7% | 60.6% |
| $V_4$ | 77.8% | 75.9 % | $V_{24}$ | 43.9% | 24.1% |
| $V_5$ | 82.3% | 62.8% | $V_{25}$ | 63.0% | 59.7% |
| $V_6$ | 73.3% | 82.2% | $V_{26}$ | 70.3% | 49.7 % |
| $V_7$ | 86.6% | 92.2% | $V_{27}$ | 86.6% | 60.6% |

| | | | | |
|---|---|---|---|---|
| $V_8$ | 80.7% | 69.1% | $V_{28}$ | 89.6% | 73.8% |
| $V_9$ | 77.8% | 70.6 % | $V_{29}$ | 89.6% | 49.1% |
| $V_{10}$ | 82.6% | 59.1% | $V_{30}$ | 82.2% | 73.8% |
| $V_{11}$ | 85.2% | 50.9% | $V_{31}$ | 98.6% | 73.8 % |
| $V_{12}$ | 13.2% | 65.3% | $V_{32}$ | 91.3% | 70.6% |
| $V_{13}$ | 46.9% | 38.8% | $V_{33}$ | 92.7% | 75.3% |
| $V_{14}$ | 73.8% | 85.3 % | $V_{34}$ | 69.1% | 69.7% |
| $V_{15}$ | 74.8% | 79.1% | $V_{35}$ | 70.3% | 75.9% |
| $V_{16}$ | 79.3% | 89.1% | $V_{36}$ | 42.5% | 23.4 % |
| $V_{17}$ | 88.7% | 85.3% | $V_{37}$ | 68.9% | 28.1% |
| $V_{18}$ | 79.8% | 85.3% | $V_{38}$ | 73.3% | 47.5% |
| $V_{19}$ | 85.2% | 76.9 % | $V_{39}$ | 82.3% | 47.5% |
| $V_{20}$ | 86.6% | 100% | $V_{40}$ | 93.9% | 65.3% |

Source: Research data, 2018.

More than 86% of students in Agricultural Engineering and 60% of Zootechnics students believe that they had a good socio-academic integration with the other students in class and that they participated in the extracurricular activities offered by the institutions. However, most of the students of the two courses (about 53% and 61%, respectively) disagreed that the social, cultural and / or sporting events offered were satisfactory. On the other hand, they consider that both courses provided quality academic and scientific events.

As for the course's contributions to personal learning and development, as well as to the conception, qualification, and professional opportunities, it is observed that the majority of students of Agricultural Engineering (between 63% and 97%) agreed that the course provided such contributions. In addition, more than 60% of the students of Zootechnics expressed the same opinion, except for the professional conception.

About 42% of the students of the Agricultural Engineering course and only 23% of the students of Zootechnics reported that they needed a scholarship to stay in the course. More than 69% of the students in the two courses partially or fully agree that family and / or personal income was sufficient for their stay in the course and that they had good housing and transportation conditions.

Even though they needed a scholarship to stay in the course, the majority (more than 70%) of the students of Agricultural Engineering affirmed that they had more personal, family and health stability, as well as motivation and persistence to achieve their goals, when compared with the students of Zootechnics. In this sense, it is deduced that the lack of identification of Zootechnical students with the chosen course (about 49%) may be one of the factors that justify such statements.

Finally, it is observed that the general infrastructure of the campus (laboratories, library, bathrooms, classrooms, and equipment) was very well evaluated by the students of the two courses, that is, more than 75% consider that the infrastructure was well preserved. Only the students of the Agricultural Engineering course reported that the leisure area and / or food court (or equivalent) did not meet their needs (approximately 87%).

Through the multivariate clustering analysis, it was also possible to identify clusters of variables that, when analyzed together and related to the condition of the student (graduate or dropout), suggest an influence on student decision-making to evade or to stay in courses in the field of Agricultural Sciences.

Figure 1 shows the dendrograms obtained from the combination of the variables in Table 1, which, according to the survey replies, resulted in 5 clusters, variables for both the Agricultural Engineering and the Zootechnics courses. Therefore, cuts (red lines) were considered around the distance 10, so that the clusters consisted of at least three variables.

Then, the Mann-Whitney non-parametric test was used to verify whether, in general and in fact, the perception of graduates differs from the perception of dropouts on these courses for each constituted group or cluster.

Table 3 shows the results of significance probabilities (values $\_p$) obtained for testing the hypotheses made from the condition researched (graduate or dropout) and the cluster variables related to each course.

**Figure 1 -** Dendrogram of courses from the Agricultural Sciences field



Agricultural Engineering

Zootechnics
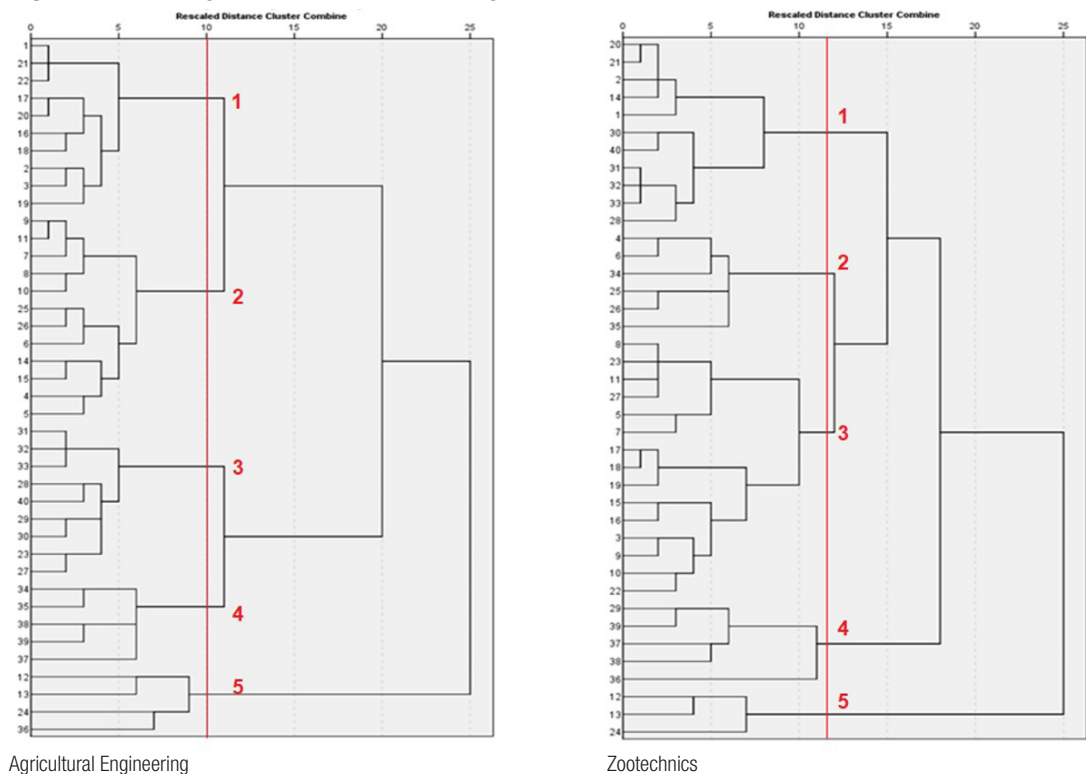
Source: Research data, 2018

**Table 3 -** Significance probabilities (values $\_p$) obtained in the Mann-Whitney hypothesis tests for courses in the field of Agricultural Sciences

|  | Agricultural Engineering | Zootechnics |
|---|---|---|
| Cluster 1 | 0.944 | 0.177 |
| Cluster 2 | 0.146 | 0.614 |
| Cluster 3 | 0.110 | 0.050* |
| Cluster 4 | 0.378 | 0.001* |
| Cluster 5 | 0.348 | 0.614 |

\* Significant for a 5% significance level.
Source: Research data, 2018.

According to the results in Table 4, there were no significant differences in the perception of the course between graduates and dropouts of Agronomic Engineering. Only for the Zootechnics course, the perception of the course related to the variables that form clusters 3 and 4 was significantly different between graduates and dropouts, at the 5% significance level.

In order to identify how much this difference is related to the perception of the students in each of these two clusters, the analysis of the posts obtained through the Mann-Whitney test was performed. According to Table 4, it is observed that dropouts from the Zootechnics course have lower ranks in both clusters, showing that they have a different perception, in relation to the graduates, about all or most of the variables that make up each of the clusters.

**Table 4 -** Analysis of the posts obtained by the Mann-Whitney test, according to the condition of the student in the Zootechnics course

|  | Student condition | N | Average of posts | Sum of posts |
|---|---|---|---|---|
| Cluster 3 | Dropout | 5 | 9.20 | 46.00 |
| | Graduate | 27 | 17.85 | 482, 00 |
| | Total | 32 | | |
| | **Student condition** | **N** | **Average of posts** | **Sum of posts** |
| Cluster 4 | Dropout | 5 | 4.20 | 21.00 |
| | Graduate | 27 | 18.78 | 507.00 |
| | Total | 32 | | |

Source: Research data, 2018.

By analyzing each cluster separately, it appears that cluster 3 is formed by the variables $V_8$, $V_{23}$, $V_{11}$, $V_{27}$, $V_5$, $V_7$, $V_{17}$, $V_{18}$, $V_{19}$, $V_{15}$, $V_{16}$, $V_3$, $V_9$, $V_{10}$ and $V_{22}$, respectively, which were grouped by associating sentences that relate specifically to the care of professors, the coordination of the course, and the institution to the needs of students; the general campus infrastructure; the curriculum, evaluation system and the course's contribution to the students' personal development; getting good grades; and, to the student socio-academic integration with the class.

Although Table 2 points to positive general results for most of the variables that make up this cluster, four of them were negatively evaluated by those dropping out of the Zootechnics course, with more than 60% of those considering that the institution did not attend (partially or fully) to their academic needs, who did not obtain good grades, that the course did not contribute to their personal development, and that did not have integration socio-academic with other students in class. On the other hand, more than 93% of the graduates point out, as strengths, that the professors met their academic needs, that the campus infrastructure was good, and that the course significantly contributed to their personal development.

For cluster 4, the variables $V_{29}$, $V_{39}$, $V_{37}$, $V_{38}$ and $V_{36}$ were grouped by associating the students' identification and motivation towards the chosen course, as well as their financial and psychological conditions during the course.

Table 2 shows general negative results for all variables that make up this cluster, with four of them being assessed in the same way by more than 80% of those dropping out of the Zootechnics course, who reported that they had no identification with the course, had no personal or family stability, and neither motivation nor health to complete it. On the other hand, over 85% of the graduates highlighted, as strengths, that they had identification with the chosen course and motivation to achieve their goals, and that they were healthy during the course. With regard to the other clusters, these proved to be homogeneous, in terms of perception of the Zootechnics course, both for graduates and for dropouts.

### Field of Humanities, Courses: Geography (EC of Ourinhos/SP), Tourism (EC of Rosana/SP) and Management (EC of Tupã/SP)

Generally, in Table 5, the lowest percentages obtained in the survey were highlighted (below 50%), featuring the sentences with which less than half of the respondents agreed (partially or fully), for courses in the field of Humanities.

**Table 5 -** Agreement (partially or fully) of graduates and dropouts for each sentence for the field of Humanities

| Variable | Geography | Tourism | Management | Variable | Geography | Tourism | Management |
|----------|-----------|---------|------------|----------|-----------|---------|------------|
| $V_1$ | 93.4% | 86.6% | 93.0% | $V_{21}$ | 94.7% | 91, 9% | 96.1% |
| $V_2$ | 87.2% | 70.3% | 85.8% | $V_{22}$ | 87.2% | 90.9% | 97.3% |
| $V_3$ | 79.3% | 69.9% | 69.9% | $V_{23}$ | 80.9% | 85.6% | 88.3% |
| $V_4$ | 80.6% | 49.8% | 68.6% | $V_{24}$ | 14.1% | 20.1% | 20.8% |
| $V_5$ | 67.8% | 64.6% | 65.5% | $V_{25}$ | 38.8% | 43.5% | 66.9% |
| $V_6$ | 64.1% | 53.6% | 73.7% | $V_{26}$ | 62.8% | 46.4% | 76.2% |
| $V_7$ | 74, 3% | 67.0% | 71.8% | $V_{27}$ | 88.2% | 88.0% | 91.4% |
| $V_8$ | 61.8% | 61.2% | 77.7% | $V_{28}$ | 74.7% | 81.3% | 76, 6% |
| $V_9$ | 66.8% | 62.6% | 75.5% | $V_{29}$ | 65.8% | 70.8% | 84.2% |
| $V_{10}$ | 63.2% | 66.5% | 78.3% | $V_{30}$ | 67.1% | 70.8% | 87.9% |
| $V_{11}$ | 81.9% | 69.9% | 76.8% | $V_{31}$ | 82.2% | 80.3% | 90.6% |
| $V_{12}$ | 1.3% | 28.7% | 30.9% | $V_{32}$ | 75.7% | 81.3% | 79.0% |
| $V_{13}$ | 28.3% | 37.3% | 50.2% | $V_{33}$ | 88.5% | 94.7% | 95.3% |
| $V_{14}$ | 74.3% | 54, 9% | 74.3% | $V_{34}$ | 67.8% | 64.1% | 78.6% |
| $V_{15}$ | 75.7% | 58.9% | 74.1% | $V_{35}$ | 63.8% | 70.8% | 78.1% |
| $V_{16}$ | 60.2% | 71.3% | 81.5% | $V_{36}$ | 49.0% | 48.4% | 37.4% |
| $V_{17}$ | 75.7% | 91.9% | 93.2% | $V_{37}$ | 69.1% | 57.4% | 73.8% |
| $V_{18}$ | 51.6% | 78.9% | 86.8% | $V_{38}$ | 89.5% | 76.0% | 81.5% |
| $V_{19}$ | 83.2% | 83.7% | 90.6% | $V_{39}$ | 69.4% | 54.5% | 80.1% |
| $V_{20}$ | 83.2% | 93.3% | 90.2% | $V_{40}$ | 82, 2% | 64.9% | 89.1% |

Source: Research data, 2018.

According to Table 5, most students (between 64% and 96%) had a positive perception (partial or full) about the Geography, Management and Tourism courses, respectively, considering that these had quality and provide the student with knowledge. In addition, for them, the curriculum was up to date, the evaluation system was adequate, and professors were efficient in transmitting knowledge, being important courses not only for professional qualification, but also for personal development. However, the students of the Tourism course, specifically, disagreed that it was possible to relate theory to practice and apply what they learned in the course to the job market.

As for academic needs, it is observed that between 61% and 82% of the students of the Geography and Tourism courses considered that the course, the institution, the coordination, and that the professors met their needs. For the students of the Management course, more than 75% agreed that their needs were fully or partially attended.

More than 74% of the students of such courses considered that they had a good socio-academic integration with other students in class, and that they participated in the extracurricular activities offered by the institution. However, more than half of the students disagreed that the social, cultural and / or sporting events offered by the institution were satisfactory. On the other hand, they consider that the institution provided quality academic and scientific events.

Most of the students of the three courses (between 75% and 95%) reported that they were committed to the course and had enough time available for studies and to attend classes. More than 80% considered that they obtained good grades and did not need to reinforce classes.

With regard to contributions to the conception, qualification, and professional opportunities, as well as to personal learning and development, more than 67% of the Management students agreed (fully or partially) that the course provided such contributions. On the other hand, even though they agreed with the professional and personal contributions of the chosen course, the students of Geography and Tourism (approximately 60%) considered that the professional opportunities were not favored.

More than 64% of the students of the three courses partially or fully agreed that family and / or personal income was sufficient for their stay in the course and that they had good housing and transportation conditions. However, almost half of the students in the Geography and Tourism courses, as well as 37% of the Management students, reported that they needed a scholarship to stay on the course.

It is observed that more than half of the students of the three courses reported that they had the personal conditions, that of family and health stability, as well as the motivation and persistence to achieve their goals during the course, further corroborating with the decision in course choice, that is, the students identified themselves with the chosen course.

Finally, the general infrastructure of the campus is highlighted (laboratories, library, bathrooms, classrooms, and equipment), which was considered adequate or in good condition by more than 60% of the students of the three courses. On the other hand, the vast majority reported that the leisure area and / or food court (or equivalent) did not meet their needs.

Figure 2 shows the dendrograms obtained from the combination of the variables in Table 2 which, according to the answers of the students, resulted in 4 clusters of variables for the Geography and Management courses, as well as 5 clusters for the Tourism course. In a way that is similar to the one considered for the field of Agricultural Sciences, cuts (red lines) around distance 10 were also considered here, so that the clusters were made up of at least three variables.

To verify whether there is a difference between the perception of graduates and dropouts from these courses for each group or cluster constituted, the Mann-Whitney

nonparametric test was use. The results of the test's significance probabilities (values $\_p$) are found in Table 6.
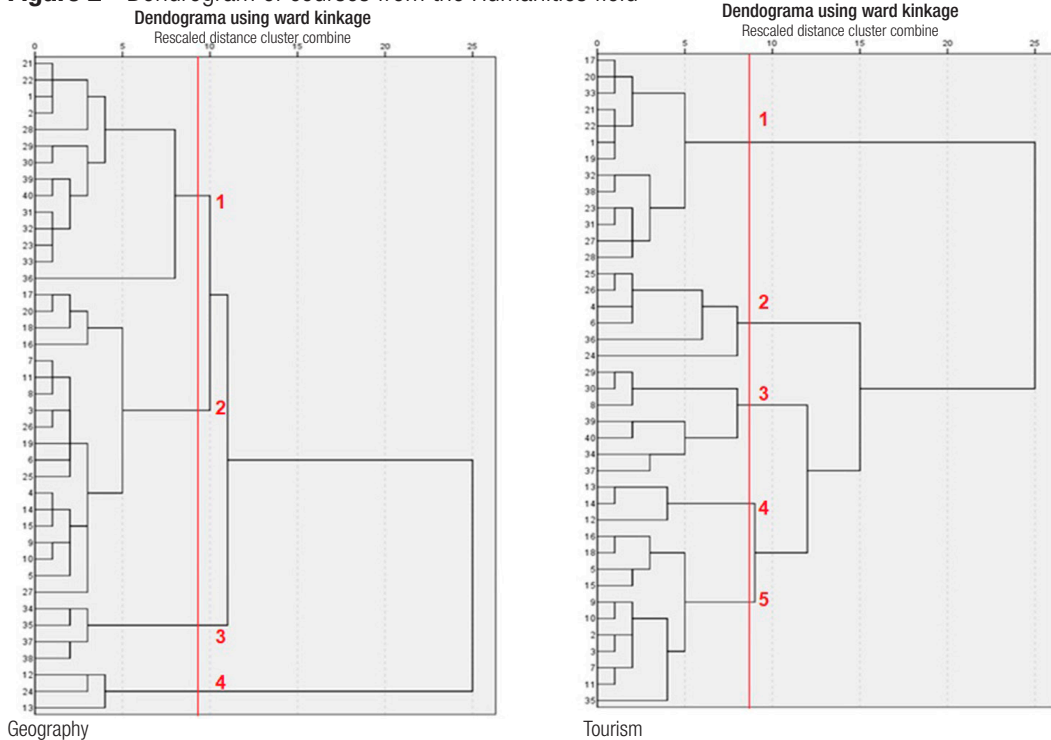
**Table 6 -** Significance probabilities (values $\_p$) obtained in the Mann-Whitney hypothesis tests for the courses in the field of Humanities
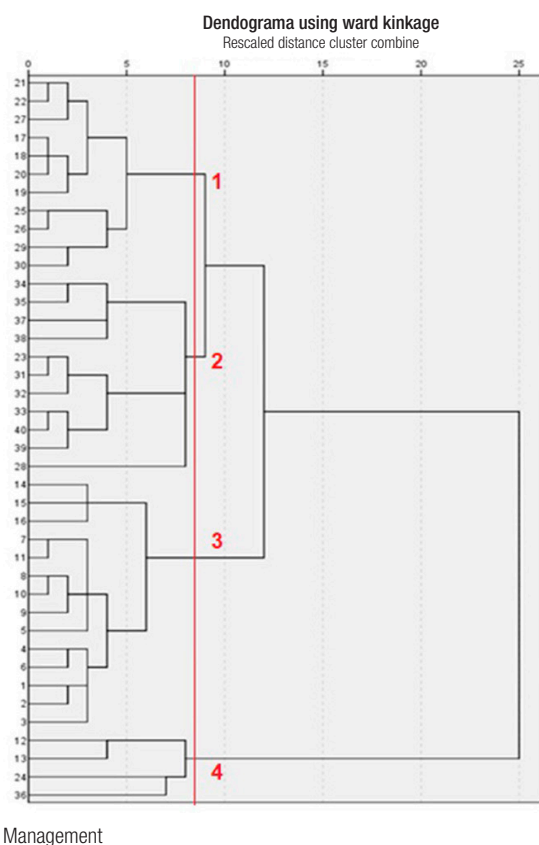
|  | Geography | Tourism | Management |
|---|---|---|---|
| Cluster 1 | 0.309 | 0.981 | 0.001* |
| Cluster 2 | 0.445 | 0.763 | 0.001* |
| Cluster 3 | 0.851 | 0.195 | 0.111 |
| Cluster 4 | 0.717 | 0.160 | 0.349 |
| Cluster 5 | - | 0.260 | - |

* Significant for a 5% significance level.
Source: Research data, 2018.

According to Table 6, there were no significant differences in the perception of the courses between graduates and dropouts from the Geography and Tourism courses. Only for the Management course the perception about the course related to the variables that make up clusters 1 and 2 was significantly different between graduates and dropouts, at the 5% level of significance.

**Figure 2 -** Dendrogram of courses from the Humanities field



Geography

Tourism

**Dendograma using ward kinkage**
Rescaled distance cluster combine



Management

In order to identify how much this difference is related to the perception of the students in each cluster, the analysis of the posts obtained by the Mann-Whitney test was carried out, as presented by Table 7.

**Table 7 -** Analysis of the posts obtained by the Mann-Whitney test, according to the condition of the students in the Management course**.**

|  | Student condition | N | Average of posts | Sum of posts |
|---|---|---|---|---|
|  | Dropout | 13 | 18.19 | 236 50 |
| Cluster 1 | Graduate | 57 | 39.45 | 2248.50 |
|  | Total | 70 |  |  |
|  | **Student condition** | **N** | **Average of posts** | **Sum of posts** |
|  | Dropout | 13 | 18.69 | 243.00 |
| Cluster 2 | Graduate | 57 | 39.33 | 2242.00 |
|  | Total | 70 |  |  |

It is observed that dropouts have much lower ranks in both clusters, showing that such students have a different perception in relation to graduates about all or most of the variables that make up each of these clusters.

The following variables were grouped in cluster 1: $V_{21}$, $V_{22}$, $V_{27}$, $V_{17}$, $V_{18}$, $V_{20}$, $V_{19}$, $V_{25}$, $V_{26}$, $V_{29}$ e $V_{30}$, respectively, which are directed to the general infrastructure of the campus (classrooms, bathrooms, and equipment), socio-academic integration with other students, identification with the chosen course, as well as the capacity of the course to provide knowledge, qualification, personal development, and good professional opportunities to students.

Table 5 shows positive general results (above 76% of agreement) for practically all the variables that make up this cluster. However, three of them can be singled out for being evaluated negatively by the dropouts, with over 40% of disagreement for: identification with the chosen course, its importance, and the opportunities it provides for professional qualification. On the other hand, more than 95% of the graduates reported, as strengths, an adequate general infrastructure of the campus and a good socio-academic integration with other students in class. The graduates were also reported to have an identification with the chosen course, and that the course provided knowledge, personal development, and appropriate professional qualification.

In a complementary way, the following variables were grouped in cluster 2: $V_{34}$, $V_{35}$, $V_{37}$, $V_{38}$, $V_{23}$, $V_{31}$, $V_{32}$, $V_{33}$, $V_{40}$, $V_{39}$ e $V_{28}$, which relate to the student's commitment to the course (time available to attend classes and study, obtain good grades and participate in extracurricular activities), financial conditions, housing and transportation, personal conditions, that of family and health stability, as well as motivation and persistence to achieve their goals during the course.

Table 5 shows general positive results for all the variables that make up this cluster. However, four of them were evaluated in a negative way specifically by the dropouts from the Management course. More than 46% of those reported that they did not participate in any extracurricular activities provided to students by the institution, and that they did not have personal and family stability during the course, nor motivation or persistence to achieve their objectives. However, over 90% of graduates highlighted, as strengths, that they were committed to the course, had enough time to attend classes, obtained good grades and had motivation and persistence to achieve their goals.

The other clusters proved to be homogeneous, with respect to the perception of the Management course, both for graduates and for dropouts.

## Discussion and conclusion

In general, it can be highlighted that graduates and dropouts from courses in the fields of Agricultural Sciences and Humanities in the ECs of the UNESP have positive perceptions regarding the quality of the course, the curriculum and the evaluation system. Other aspects that also received a good feedback were: the treatment provided by the professors and the coordination of the course, the contributions of the course in relation to knowledge and personal development, as well as the general conditions

of the infrastructure of the respective campi (teaching laboratories, library, classrooms, bathrooms, equipment, etc.). However, there was a negative assessment of the leisure area and / or food court (or equivalent) and the quality of the events, especially social, cultural and / or sports offered by the institution. That assessment was negative by students of practically all the analyzed courses.

The ECs have more compact academic and administrative structures than those of University Units, however, they are no less efficient. The physical structure of these campi was provided by the municipal government and so, some of them still require extensions and advances so that courses and events are offered with more quality, and other needs of students are better met.

Specifically, for the Agricultural Engineering course in the field of Agricultural Sciences, as well as for the Geography and Tourism courses in the field of Humanities, there was no significant difference between the assessments of graduates and dropouts, when grouping the variables, which suggested an influence on student decision-making to evade or stay in these courses. Therefore, the information contained in Tables 2 and 5 is sufficient to point out strengths, weaknesses, and points to be improved, suggesting strategies for controlling and combating evasion. It should be noted that students of these three courses are the ones who most need a scholarship for permanence, as well as reinforcement in classes. Besides, students from Geography and Tourism courses, specially, consider that the courses did not provide good professional opportunities.

As for the Zootechnics course in the field of Agricultural Sciences, and for the Management course in the field of Humanities, it was observed that the statements intrinsically related to the students and their well-being are those that directly or indirectly interfered in the student's decision to evade the chosen course. These statements are those such as lack of identification with the course; lack of motivation or persistence to achieve the objectives; lack of health and personal and / or family stability during the course; lack of interest in participating in extracurricular activities; and lack of socio-academic integration with other students in class. These results corroborate with some studies in the literature on the subject, already referenced in this work. Only those evaded from the Zootechnics course considered that the institution did not meet their needs.

Therefore, in addition to student retention policies, it is necessary to intensify public policies aimed at solving pedagogical and psychological issues that can assist students in the treatment of their personal and individual problems, motivating them to complete the course (SOUSA; OLIVEIRA; BORGES, 2018; IMPERATORI, 2017). Litalien and Guay (2015) and Morales, Ambrose-Roman and Perez-Maldonado (2016) also suggest the use of motivational resources and psychological support through tutors, counselors, or teachers, in addition to guidance by well-known successful colleagues (students), in order to shape study habits, resulting in increased approval rates, social integration and involvement with the university community.

Likewise, aspects intrinsically related to the students and their well-being were the ones that most influenced the decision to stay at the institution, namely, commitment and identification with the course, availability of time to attend classes and, consequently, get good grades, as well as health, motivation, and persistence to achieve their goals.

The graduates of courses from both fields also emphasize the adequate infrastructure of the campi. In this sense, Tinto (1993) states that the greater the integration of student characteristics (academic abilities and motivations) with the social and academic characteristics of the HEI, the lower the chance of evasion occurring.

Beyond that, it is possible to state that it became evident the use of the data collection instrument validated by specialists in the field of Higher Education Management, as well as the method proposed in this study. Such procedures may assist HEIs in the development of new research to diagnose predisposition to dropout, based not only on the perception of graduates and dropouts, but also of current undergraduate students. In a complementary way, the methodology also makes it possible to highlight the strengths (positives) and weaknesses (negatives) related to the institution, the course, the professors and / or the students themselves, enabling the HEI to direct strategic and managerial actions towards students in order for them to stay at the university and complete the chosen course.

Finally, the limitation of this study is the difficulty in accessing graduates and dropouts to compose the sample. This situation requires only that the survey be done when the event occurs (dropout or student training), ensuring the expansion of the sample size and the reliability of the responses. That includes the possibility of using other statistical analysis techniques.

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